

CLAIMS

1. A method of inducing a necrotic effect in specific cells of a plant, wherein a plant is transformed with a chimaeric gene, the coding sequence of said gene coding for a mature pokeweed antiviral protein or part thereof, said gene comprising a promoter which acts in response to the application of a specific stimulus to said plant, such that said mature pokeweed antiviral protein or part thereof is expressed in specific cells of said plant.
2. A method of inducing a necrotic effect in specific cells of a plant according to Claim 1, wherein said chimaeric gene encodes the mature PAP-S protein, said coding sequence being that depicted in SEQ. ID. No.: 3 or a sequence having the same functionality and being homologous thereto, and the amino acid sequence being that depicted in SEQ. ID. No.: 4 or a sequence having the same functionality and being homologous therewith.
3. A method of inducing a necrotic effect in specific cells of a plant according to Claim 1, wherein said chimaeric gene encodes the PAP-S α protein, said coding sequence being depicted in SEQ. ID. No.: 5 or a sequence having the same functionality and being homologous thereto, and the amino acid sequence being that depicted in SEQ. ID. No.: 6 or a sequence having the same functionality and being homologous therewith.

4. A method of inducing a necrotic effect in specific cells of a plant according to Claim 1, wherein said chimaeric gene encodes the PAP-S β protein, said coding sequence being that depicted in SEQ. ID. No.: 7 or a sequence having the same functionality and being homologous therewith and the amino acid sequence being that depicted in SEQ. ID. No.: 8 or a sequence having the same functionality and being homologous therewith.

A method of inducing a necrotic effect in specific cells of a plant according to Claim 1, wherein said chimaeric gene encodes the mature PAP' protein or a variant thereof, said coding sequence being that of nucleotides 290-1076 of SEQ. ID. Nos.: 30 and 31.

5. A method of inducing a necrotic effect in specific cells of a plant according to Claim 1, wherein said chimaeric gene encodes the mature PAP II protein, said coding sequence being that of nucleotides 75-903 of SEQ. ID. No.: 32.

7. A method of inducing a necrotic effect in specific cells of a plant according to any one of Claims 2-6, wherein said coding sequence is at least 60% homologous to said SEQ. ID.

8. A method of inducing a necrotic effect in specific cells of a plant according to Claim 7, wherein said coding sequence is at least 70% homologous to said SEQ. ID.

9. A method of inducing a necrotic effect in specific cells of a plant according to Claim 8, wherein said coding sequence is at least 80% homologous to said SEQ. ID.
10. A method of inducing a necrotic effect in specific cells of a plant, wherein a plant is transformed with two chimaeric genes, a coding sequence for the first of said genes coding for an inactivated pokeweed antiviral protein, and a coding sequence of the second of said genes coding for a second molecule, which molecule is an activator of said inactivated pokeweed antiviral protein, each of said two genes comprising a promoter, which promoter acts conjointly in response to the application of a specific stimulus to said plant so that said inactivated pokeweed antiviral protein is activated in specific cells of a plant.
11. A method of inducing a necrotic effect in specific cells of a plant according to Claim 10, wherein the terminal blocking sequence of said inactivated pokeweed antiviral protein has an additional necrotic effect on the cell or pathogen.
12. A method of inducing a necrotic effect in specific cells of a plant according to Claim 11, wherein said terminal blocking sequence is the oryzacystatin sequence depicted in SEQ. ID. No.: 17.
13. A method of inducing a necrotic effect in specific cells of a plant according to Claim 11, wherein said terminal blocking sequence is a mature PAP inactivating molecule.

14. A method of inducing a necrotic effect in specific cells of a plant according to Claim 13, wherein said terminal blocking sequence is a native Pro-PAP terminal sequence from any Pro-PAP molecule.
15. A method of inducing a necrotic effect in specific cells of a plant according to any one of Claims 11, 13, or 14, wherein said terminal blocking sequence is a C-terminal blocking sequence.
16. A method of inducing a necrotic effect in specific cells of a plant according to any one of Claims 11, 13, or 14, wherein said terminal blocking sequence is a N-terminal blocking sequence.
17. A method of inducing a necrotic effect in specific cells of a plant according to any one of Claims 10-16, wherein said coding sequence for said inactivated pokeweed antiviral protein comprises a specific cleavage site between the mature pokeweed antiviral protein and the blocking sequence.
18. A method of inducing a necrotic effect in specific cells of a plant according to Claim 16, wherein said cleavage site is the Tobacco Etch Virus (TEV) NIa protease cleavage site (SEQ. ID. Nos.: 28 or 29).
19. A method of inducing a necrotic effect in specific cells of a plant according to any one of Claims 10-17, wherein said coding sequence of said second molecule is a protease which cleaves the specific cleavage site.

20. A method of inducing a necrotic effect in specific cells of a plant according to Claim 19 when dependent on Claim 18, wherein said protease is TEV N1a protease.
21. A method of inducing a necrotic effect in specific cells of a plant according to any one of Claims 10-20, wherein said promoters have an overlapping expression site.
22. A method of inducing a necrotic effect in specific cells of a plant, wherein the plant is transformed with a chimaeric gene, the coding sequence of said gene coding for a precursor PAP molecule or a C-terminal deletion thereof, said gene comprising a promoter which acts in response to the application of a specific stimulus to the plant, such that the protein expressed by said coding sequence is expressed in specific cells of said plant, said promoter being appropriately selected to provide either nematode infection disruption, sterility, changes in flower morphology, abscission, seed release or trichome development.
23. A method of inducing a necrotic effect in specific cells of a plant according to Claim 22, wherein said coding sequence encodes the Pro-PAP-S protein.
24. A method of inducing a necrotic effect in specific cells of a plant according to Claim 22, wherein said coding sequence is that depicted in SEQ. ID. No.: 1 and the amino acid sequence is that depicted in SEQ. ID. No.: 2.

25. A method of inducing a necrotic effect in specific cells of a plant according to Claim 22, wherein said coding sequence encodes the PAP' protein or a variant thereof, said sequence being that depicted in SEQ. ID. Nos. 30 or 31.
26. A method of inducing a necrotic effect in specific cells of a plant according to Claim 22, wherein said coding sequence encodes PAP III, said sequence being that depicted in SEQ. ID. No.: 32.
27. A method of inducing a necrotic effect in specific cells of a plant according to any one of Claims 1-26, wherein said stimulus is constituted by pathogenic attack, chemical inducement or natural development of the plant.
28. A method of inducing a necrotic effect in specific cells of a plant according to any one of Claims 1-20, wherein said promoter is selected to provide one of the following: nematode infection disruption, sterility, changes in flower morphology, abscission, seed release or trichome development.
29. A plant transformed by the method according to any one of Claims 1-28.
30. A recombinant plant cell transformed by the method according to any one of Claims 1-28.
31. A DNA isolate of a chimaeric gene in combination with the method of any one of Claims 1-28.

32. A biologically functional expression vehicle containing a chimaeric gene in combination with the method of any one of Claims 1-28.

32. A biologically functional expression vehicle containing a chimaeric gene in combination with the method of any one of Claims 1-28.